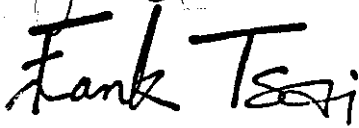


EXHIBIT B

Test Report

Report No.	E0474768
Specifications	FCC Part 74
Test Method	ANSI C63.4 1992
Applicant address	32-1, Lane 38, Li-Der Street, Tay-Pyng Taichung, Taiwan, R.O.C.
Applicant Items tested Model No.	Ecen Electronics Co., Ltd. WIRELESS MICROPHONE TRANSMITTER ET-803
Results	As detailed within this report
Sample received date	08/26/1998 (month / day / year)
Prepared by	 project engineer
Authorized by	 General Manager (Frank Tsai)
Issue date	NOV. 10, 1998 (month / day / year)
Modifications	None
Tested by	Training Research Co., Ltd.
Office at	2F, No. 571, Chung Hsiao E. Road, Sec.7, Taipei, Taiwan
Open site at	No. 5-3, Lane 21, Yen Chiu Yuan Rd., Sec.4, Taipei Taiwan

Conditions of issue:

- (1) This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.**
- (2) This report must not be used by the client to claim product endorsement by NVLAP or nay agency of U.S. Government.**

★ FCC ID : LL4ET-803

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Chapter 0 Application for Certification

- 2.983 (a) : Ecen Electronics Co., Ltd. –applicant and manufacturer
- 2.983 (b) : The equipment is a transmitter, wireless microphone
Model : ET-803
- 2.983 (c) : Quantity production is planned
- 2.983 (d) (1) : Type of emission – F3E- FM Modulation
- 2.983 (d) (2) : 100 Hz – 13.284 KHz
- 2.983 (d) (3) : 2.643 mW
- 2.983 (d) (4) : Specification of 250 mW is met by the equipment in the applicable part 74.861 (e)(1)
- 2.983 (d) (5) : Final RF amplifier stage current : 25mA, 9V Battery
- 2.983 (d) (6) : Description follows
- 2.983 (d) (7) : Complete circuit diagrams are included . No modification was made.
- 2.983 (d) (8) : Instruction sheet to user included.
- 2.983 (d) (9) : Tune up procedure follows
- 2.983 (d) (11) : Description follows
- 2.983 (d) (12) : N/A

Chapter 1 GENERAL

1.1 Introduction :

The following measurement report is submitted on behalf of *Ecen Electronics Co., Ltd.* in support of a wireless microphone certification in accordance with FCC Rules. 2.981 through 2.999 and 74.861.

Description of EUT :

EUT	:	WIRELESS MICROPHONE TRANSMITTER
Model	:	ET-803
Carrier Frequency Range	:	174 ~ 216 MHz
RF Power Output	:	2.643 mW
Supply Voltage	:	DC 9V
Supply Current	:	25 mA
Frequency Response	:	100 Hz ~ 13.284 KHz
Frequency Stability	:	0.005%
Operating Temperature	:	-30 to +50 degree centigrade

Wireless microphone is a transmitter which operates in the frequency range of 174 ~ 216 MHz. (174.500MHz, 192.230MHz, 213.390MHz tested) This microphone is worn by a performer and other participants in a program, filming, reporting ...etc. The relative receiver of this microphone's Model No. : EP-801 (Doc Approved) is in applying.

1.2 Description of Support Equipment :

N/A

Chapter 2 Power Output Measurement

2.1 Rules and Specification Limits

2.985

74.861 (e) (1) : The power of the measured unmodulated carrier power at output of the transmitter power amplifier (antenna input power) may not exceed the following :

1. 54 – 72, 76 – 88 and 174 – 216 MHz band 50 mW.
2. 470 – 608 AND 614 – 806 MHz BAND 250 W.

2.2 Test condition and setup :

1. Measurement was made on open-field test site. The EUT system was placed on non-conductive turntable which is 0.8 meters height, top surface 1.0 X 1.5 meter. The EUT was placed in three direction of the space in order to obtain maximum emission.
2. A EMCO whole range antenna with horizontal and vertical polarization was raised from 1 – 4 meter as well as the turntable was rotate from 0 to 360 degree to search for the maximum Field Strength Spectrum where the spectrum analyzer was operated in the quasi-peak detection mode. Recorded all the values which measured under horizontal and vertical position for the biconical antenna.
3. The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in Watt.
 - (1) The actual field intensity in decibels referenced to 1 micro volt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency.

$$FI_a(\text{dBuV/m}) = FI_r(\text{dBuV}) + \text{Corrected (dB)}$$

$$\text{Corrected (dB)} = AF(\text{dB}) + CL(\text{dB})$$

FI_a : Actual Field Intensity

FI_r : Reading of the Field Intensity

AF : Antenna Factor

CL : Cable Loss

- (2) The field intensity in Volt can then be determined by the following equation:

$$FI(\text{Volt}) = 10^{FI(\text{dBuV/m}) / 20} \times 10^{-6}$$

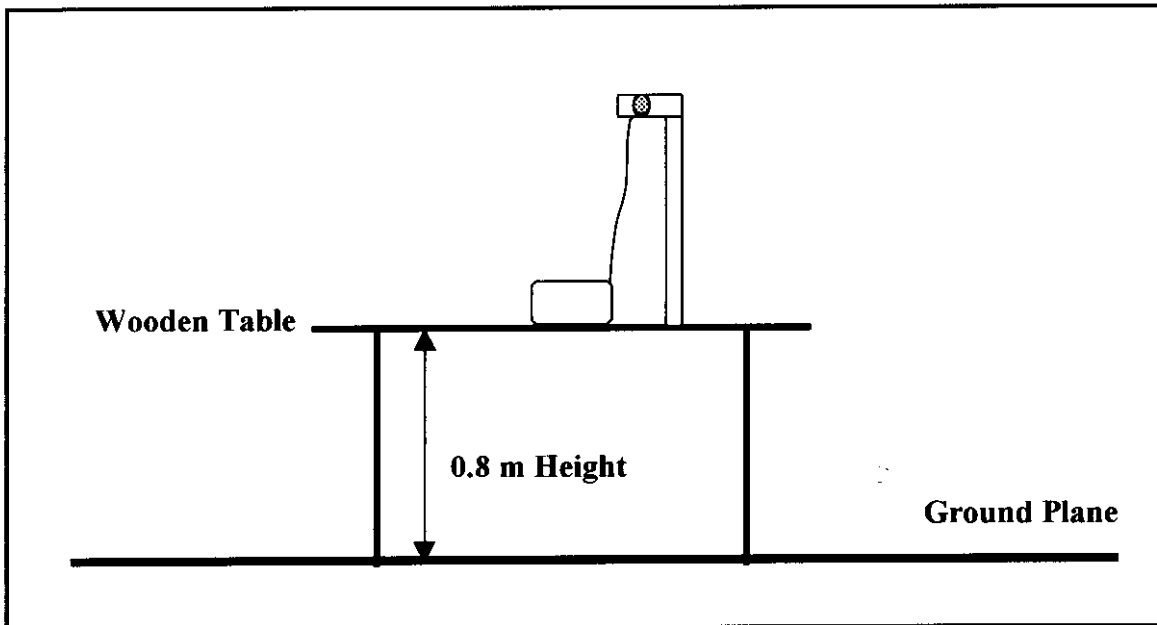
The field intensity in Watt can then be determined by the following equation :

$$P(\text{watt}) = FI^2(\text{Volt}) \times d^2(\text{meter}) / 30$$

P : Power in Watt

D : Measurement Distance (3 M)

1.3 Configuration of test setup



1.4 Location of the Measurement Site :

The radiated emissions measurements required by the Rules were performed on the Three-meter, open-field test site maintained by Training Research CO., Ltd., No. 5-3, Lane 21, Yen-Chiu-Yuan Rd., Sec. 4, Taipei, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the Commission. The conducted power line Emissions tests were performed in a shielded enclosure also located at the above facility.

Training Research Co., Ltd. is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.5 General Test Condition :

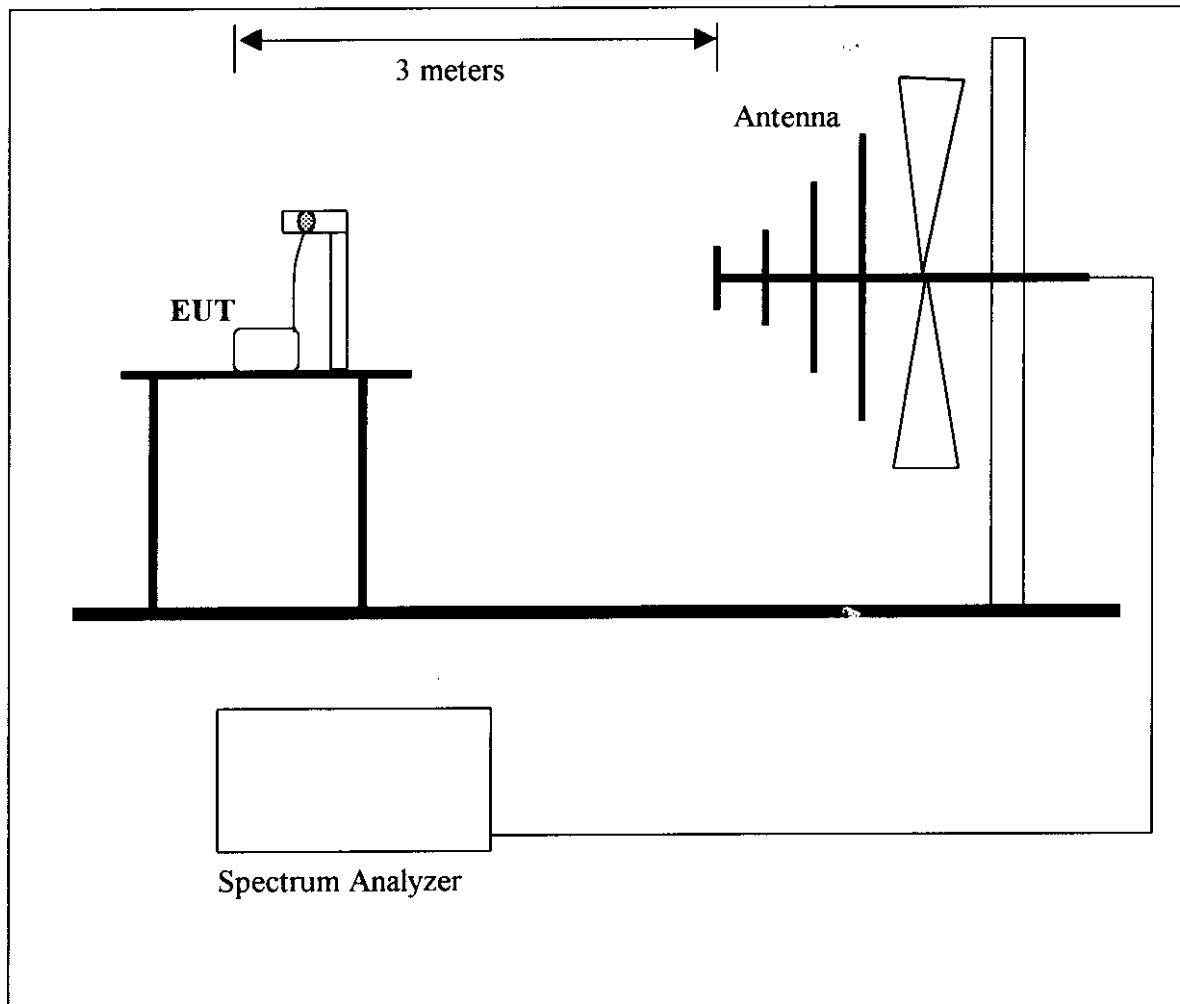
The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests was chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated.

2.3 List of test Instrument :

Instrument name	Model No.	Brand	Serial No.	Calibration Date	
				Last	Next
Spectrum analyzer	8568B	H P	3004A18617	05/15/98	05/15/99
Quasi-peak Adapter	85650A	H P	2521A00984	05/15/98	05/15/99
RF Pre-selector	85685A	H P	2947A01011	05/15/98	05/15/99
Spectrum analyzer	8591A	H P	2919A00263	01/07/98	01/07/99
Antenna (30M-2G Hz)	3142	EMCO	1296	06/10/98	06/10/99
Open test side (Antenna, Amplify, cable calibrated together)				05/15/98	05/15/99

The level of confidence of 95%, the uncertainty of measurement of radiated emission is ± 4.96 dB.

2.4 Measurement Configuration



2.5 Measurement Result

1. Carrier Frequency : 174.500 MHz

$$\text{Corrected (dB)} = \text{AF(dB)} + \text{CL(dB)} = -22.02 \text{ dB/m}$$

$$\text{FI}_a(\text{dBuV/m}) = \text{FI}_r(\text{dBuV}) + \text{Corrected (dB)} = 119.61 - 22.02 = 97.59 \text{ dBuV/m}$$

The maximum field measured is 97.59 dBuV/m

$$\text{FI (Volt)} = 10^{97.59/20} \times 10^{-6} = 0.07577 \text{ V}$$

$$\text{FI (mW)} = (0.07577 \times 3)^2 / 30 = 1.722 \text{ mW}$$

2. Carrier Frequency : 192.230 MHz

$$\text{Corrected (dB)} = \text{AF(dB)} + \text{CL(dB)} = -21.14 \text{ dB/m}$$

$$\text{FI}_a(\text{dBuV/m}) = \text{FI}_r(\text{dBuV}) + \text{Corrected (dB)} = 116.76 - 21.14 = 95.62 \text{ dBuV/m}$$

The maximum field measured is 95.62 dBuV/m

$$\text{FI (Volt)} = 10^{95.62/20} \times 10^{-6} = 0.06039 \text{ V}$$

$$\text{FI (mW)} = (0.06039 \times 3)^2 / 30 = 1.094 \text{ mW}$$

3. Carrier Frequency : 213.390 MHz

$$\text{Corrected (dB)} = \text{AF(dB)} + \text{CL(dB)} = -20.49 \text{ dB/m}$$

$$\text{FI}_a(\text{dBuV/m}) = \text{FI}_r(\text{dBuV}) + \text{Corrected (dB)} = 119.94 - 20.49 = 99.45 \text{ dBuV/m}$$

The maximum field measured is 99.45 dBuV/m

$$\text{FI (Volt)} = 10^{99.45/20} \times 10^{-6} = 0.09386 \text{ V}$$

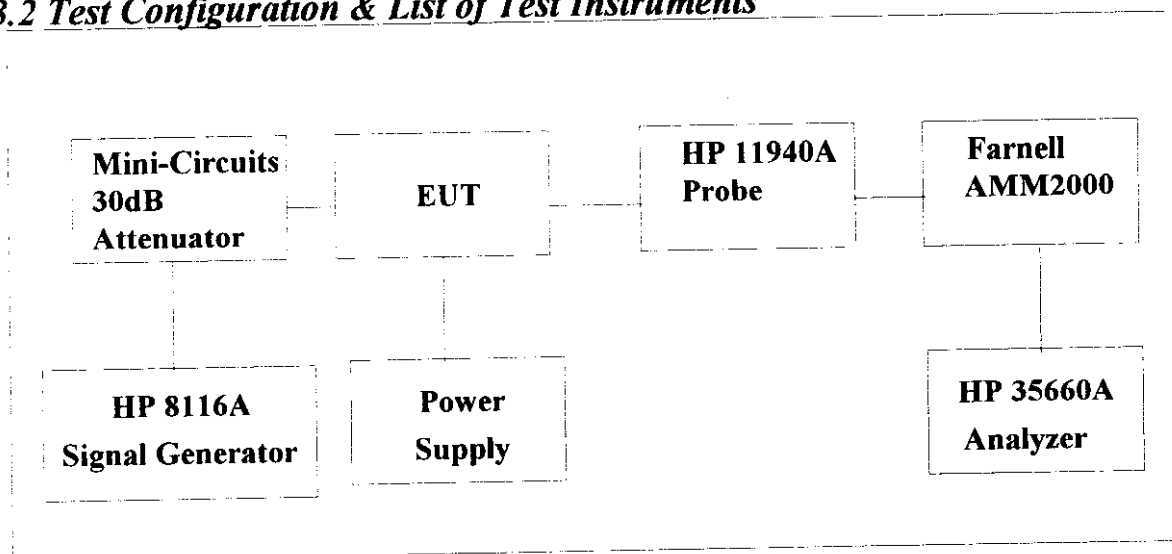
$$\text{FI (mW)} = (0.09386 \times 3)^2 / 30 = 2.643 \text{ mW}$$

Chapter 3 Modulation Characteristics Measurement

3.1 Rules and Specification Limits

2. 987(a) Voice modulated communication equipment
4. 987(b) Equipment which employs modulation limiting

3.2 Test Configuration & List of Test Instruments



List of test instrument :

Manufacturer	Device	Model	Input Impedance
HP	Dynamic Signal Analyzer	HP35660A	50
HP	Signal Generator 50 MHz	HP8116A	50
Farnell	Modulation Meter	AMM2000	---
HP	Close-Field Probe 30M~1GHz	11940A	---

3.3 Frequency Response of Audio Modulation Circuit Measurement

Condition & Setup

2.987 (a)

1. The EUT and test equipment were set up as shown on the Section 4.2 .
2. The Plus/Function generator was connected to the audio input circuit/microphone of the EUT.
3. The audio signal input was adjusted to obtain 50% modulation at 1 KHz.
4. With input levels held constant and below limiting at all frequencies, the generator was varied from 100 Hz to 51.3 kHz.
5. The response in dBVrms relative to 1kHz was then measured, using the HP 35660A Dynamic Signal Analyzer as follow page that have no page number.

Number: 10

Update Rate: 5

Overlap: 0%

AVERAGE IN PROGRESS

Meas

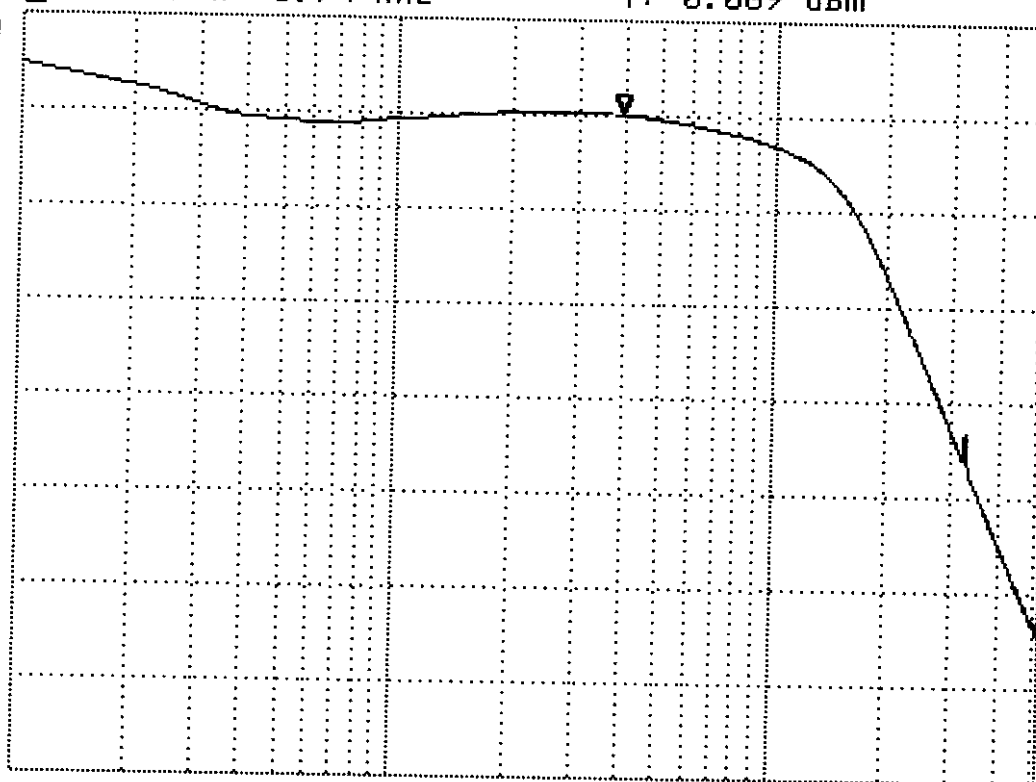
Marker X: 3.94 kHz

Y: 0.069 dBm

LogMag

10
dB
/div

-70

Start: 100 Hz
Spectrum Chan 1Stop: 51.3 kHz
PEAK: 1788

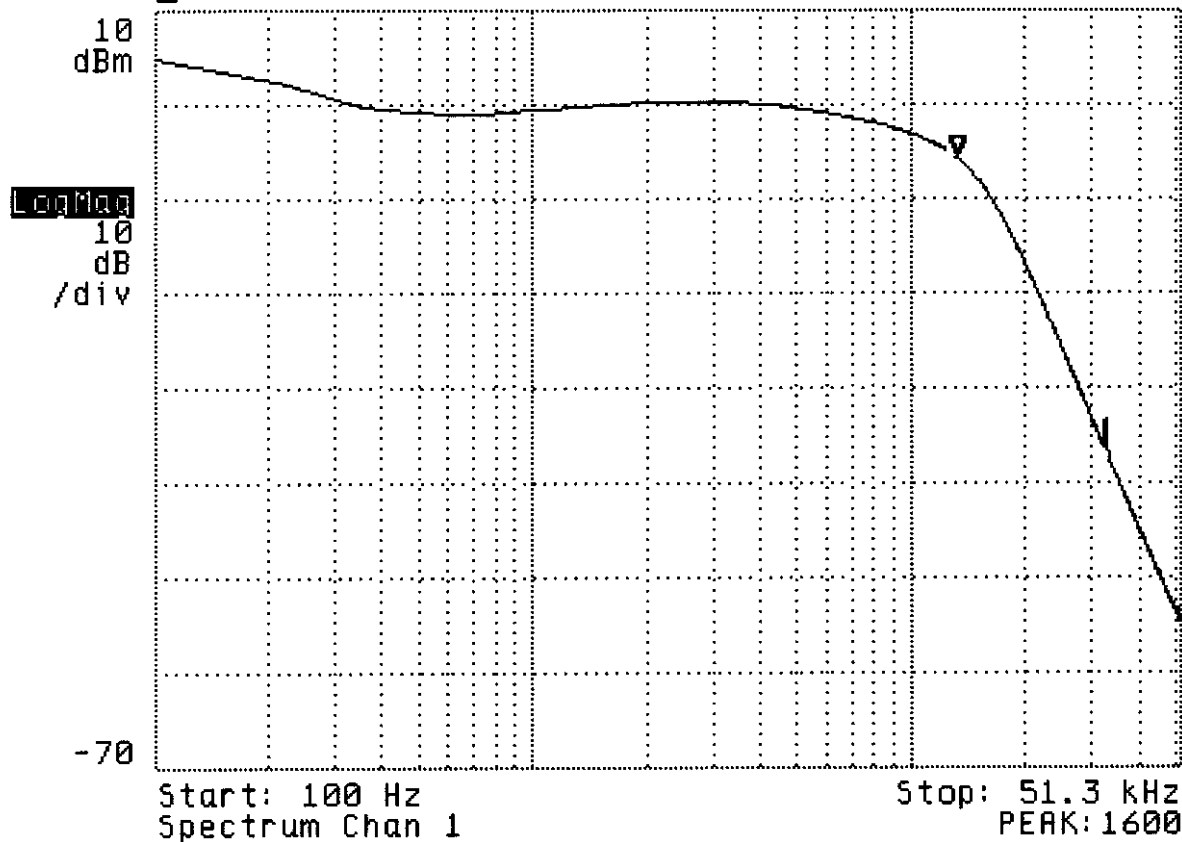
Number: 10
Overlap: 0%

Update Rate: 5

AVERAGE IN PROGRESS

Meas

Marker X: 13.284 kHz Y: -5.723 dBm



3.4 Frequency Response of Audio Low Pass Filter Measurement Condition & Setup

1. The measurement condition and setup as Section 3.3 .
2. With input levels held constant and below limiting at all frequencies , the generator was varied from 1kHz to 102.5kHz .
3. The response in dBVrms relative to 1kHz was then measured, using the HP 35660A Dynamic Signal Analyzer as follow page that have no page number.

3.5 Modulation Limiting Measurement Condition & Setup

1. The signal generator was connected to the input of the EUT as for “Frequency Response of the Modulating Circuit”.
2. The modulation response was measured for each of three frequencies : 100Hz, 868Hz and 13.284KHz .
3. The input level was varied from 30% modulation to at least 20 dB higher than the saturation point .
4. Measurements were performed for both negative and positive modulation and the respective results were recorded .
5. Measurement results as Chart 3.1 to 3.2

Center: 51.3 kHz

Span: 102.4 kHz

Start: 100 Hz

Rec Lg: 3.906 ms

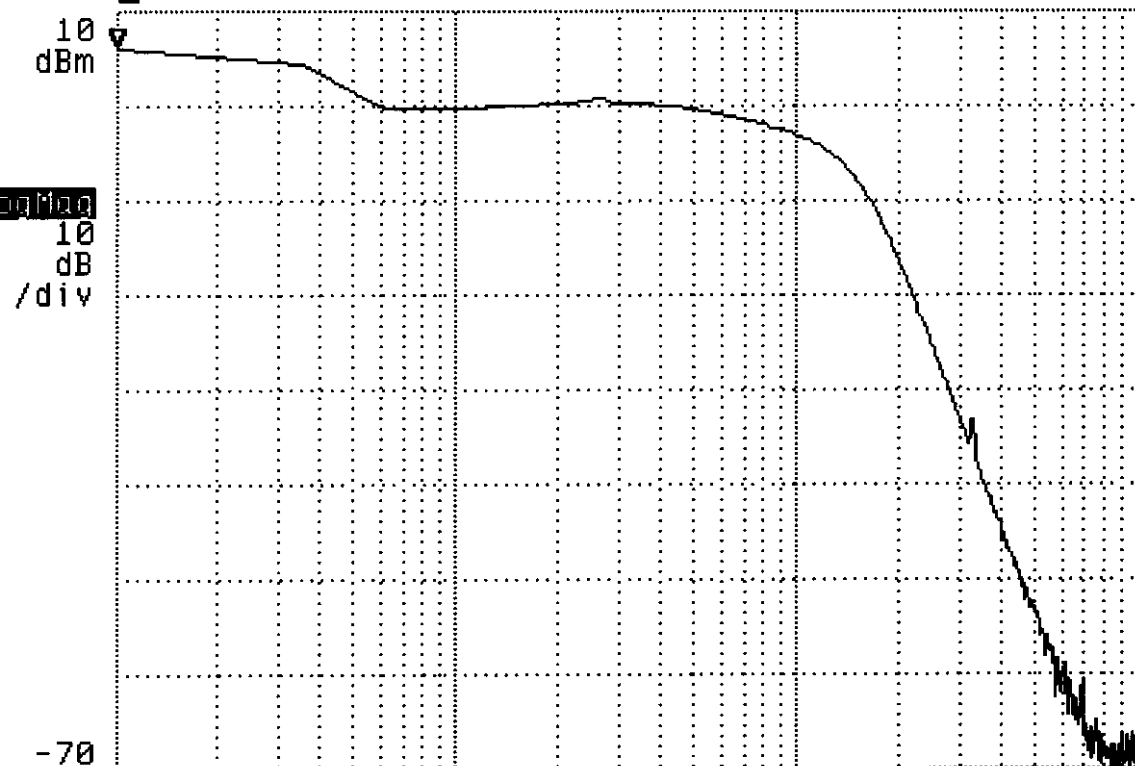
AVERAGE IN PROGRESS

Meas

Marker X: 100 Hz

Y: 5.984 dBm

LogMag

Start: 100 Hz
Spectrum Chan 1Stop: 102.5 kHz
OVLD PEAK: 970

Center: 51.3 kHz
Start: 100 Hz

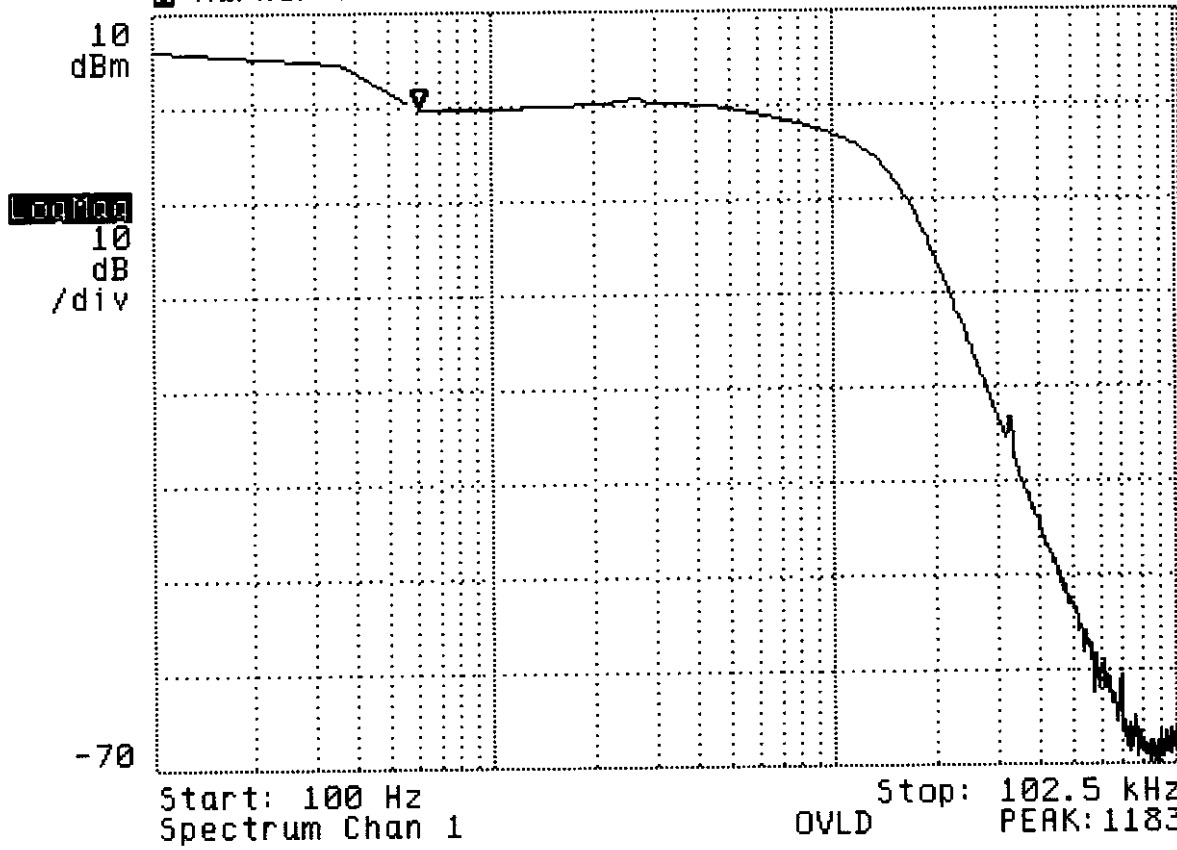
Span: 102.4 kHz
Rec Lg: 3.906 ms

AVERAGE IN PROGRESS

Meas

Marker X: 612 Hz

Y: -0.205 dBm



Center: 51.3 kHz

Span: 102.4 kHz

Start: 100 Hz

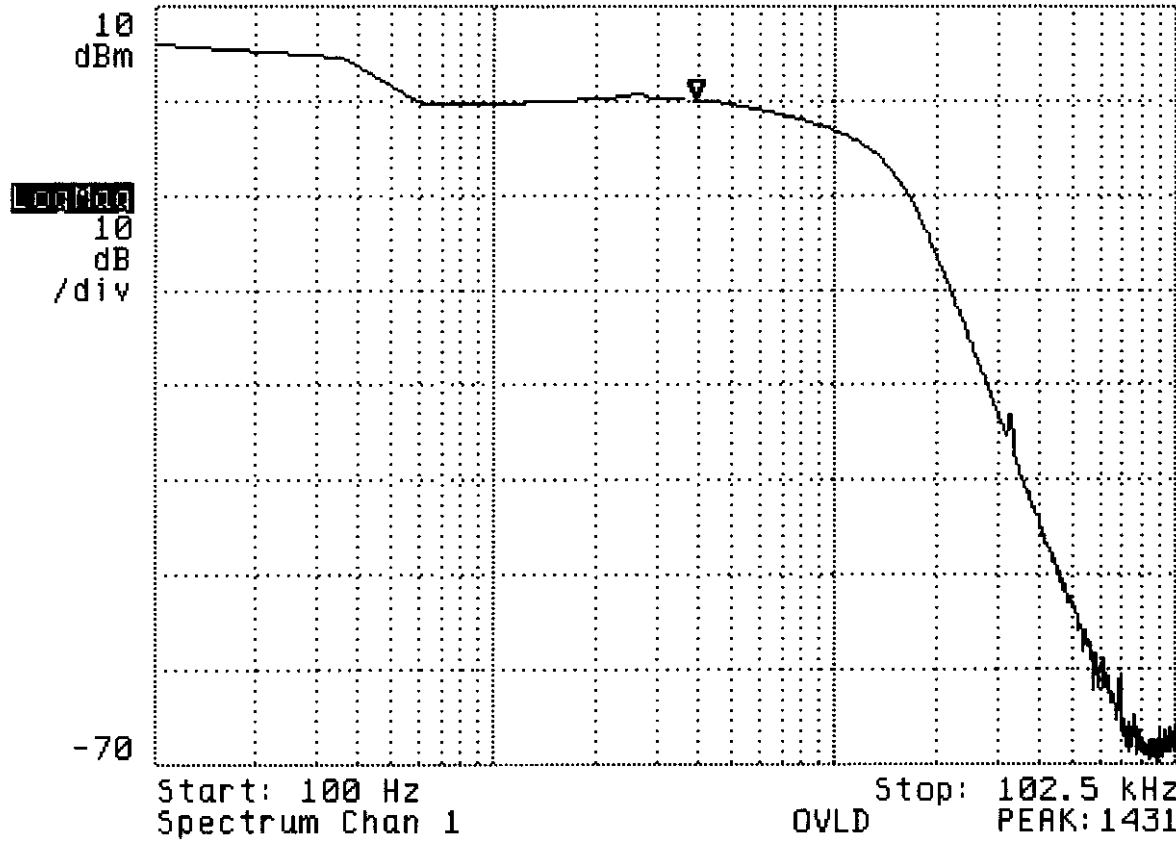
Rec Lg: 3.906 ms

AVERAGE IN PROGRESS

Meas

Marker X: 3.94 kHz

Y: 0.096 dBm



Offset: OFF

X Ref: 51.2 kHz

Y Ref: -26.99 dBm

AVERAGE IN PROGRESS

Meas

Marker X: 13.156 kHz Y: -5.462 dBm

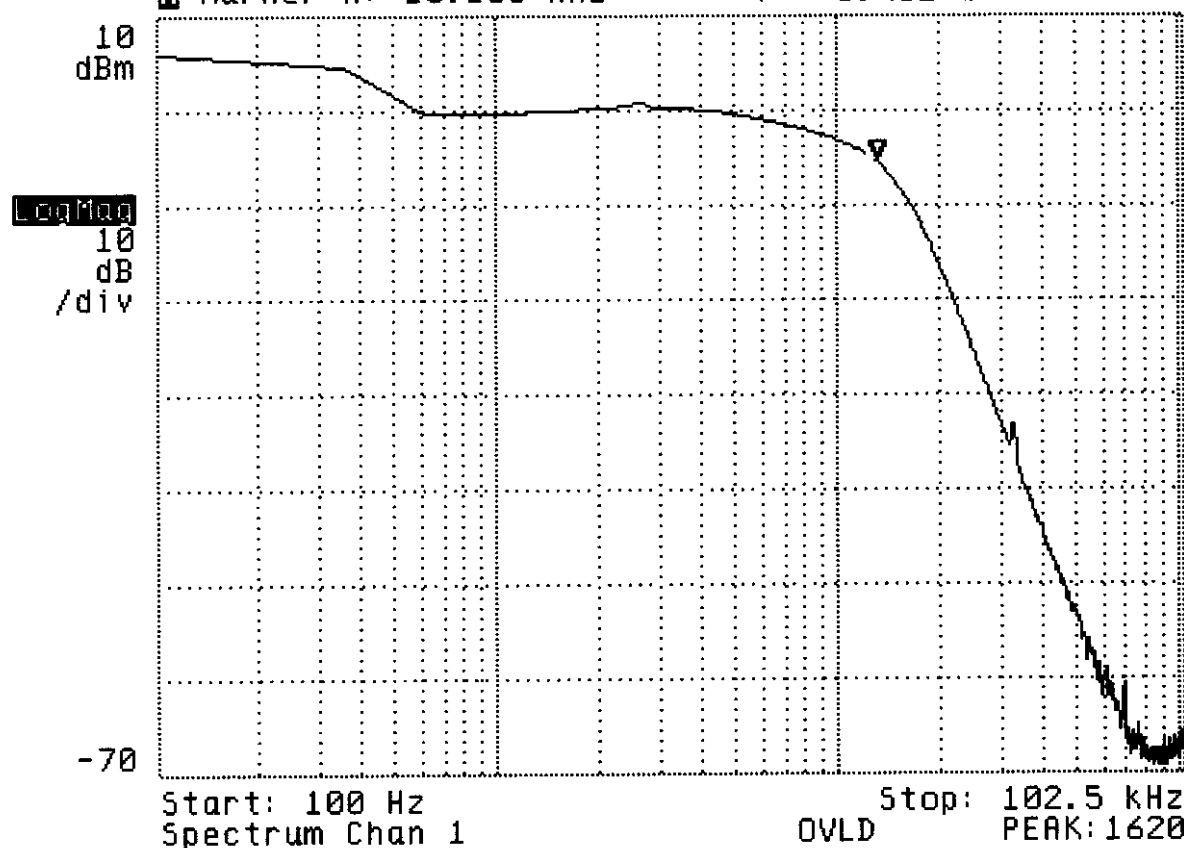


Chart 3.1 Modulation Limiting Measurement Negative

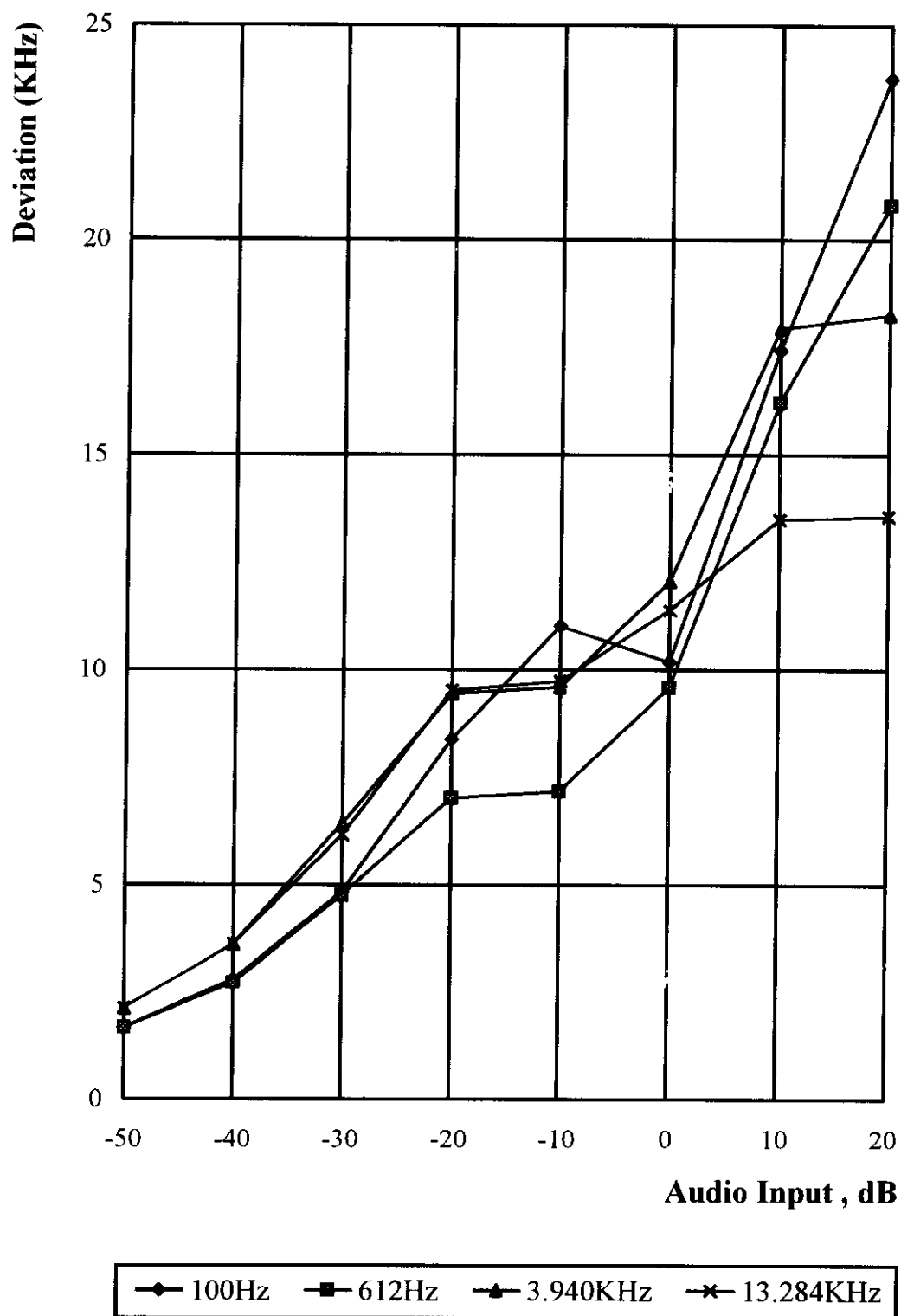


Chart 3.2 Modulation Limiting Measurement Positive

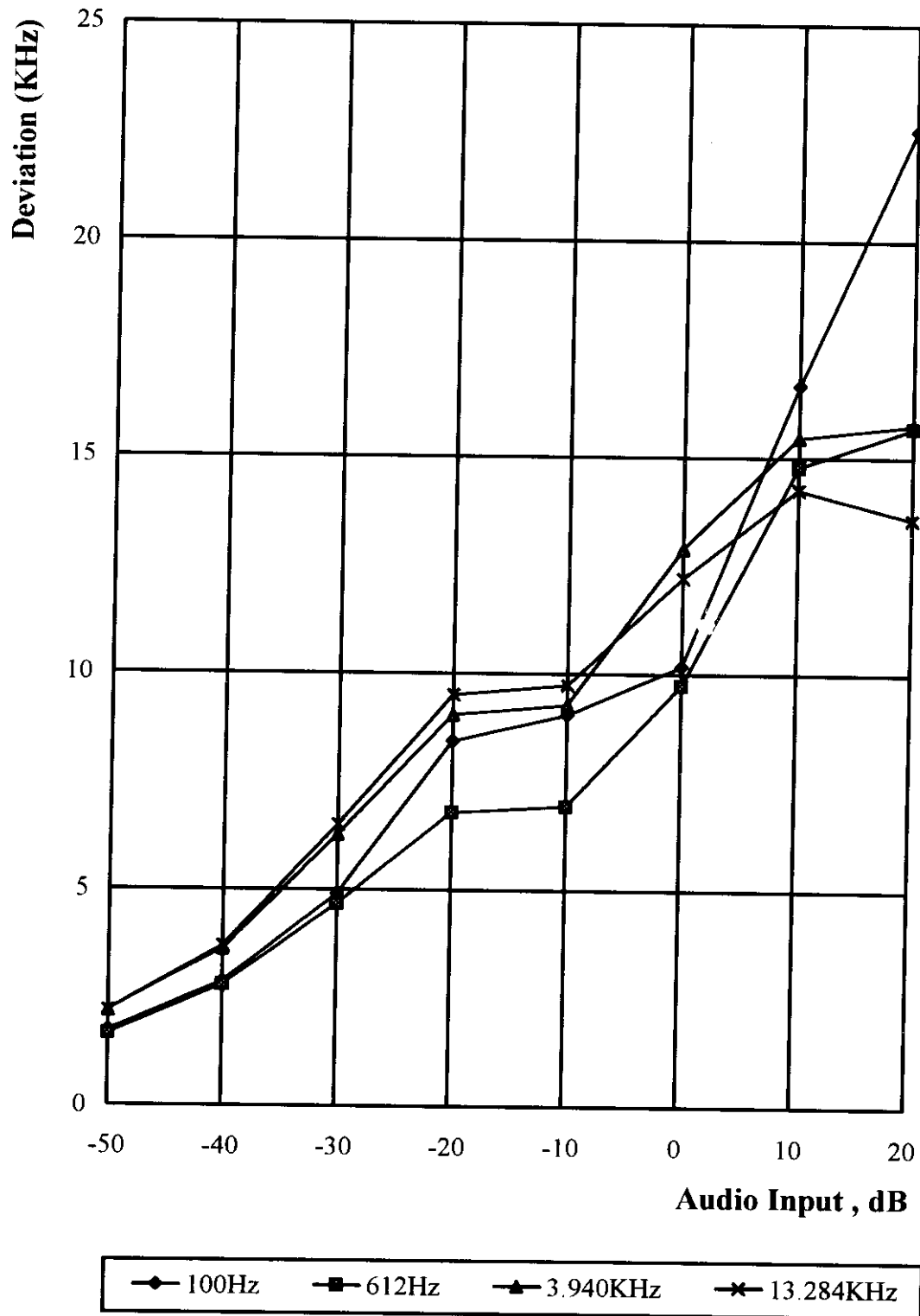


Chart 4 Occupied Bandwidth Measurement

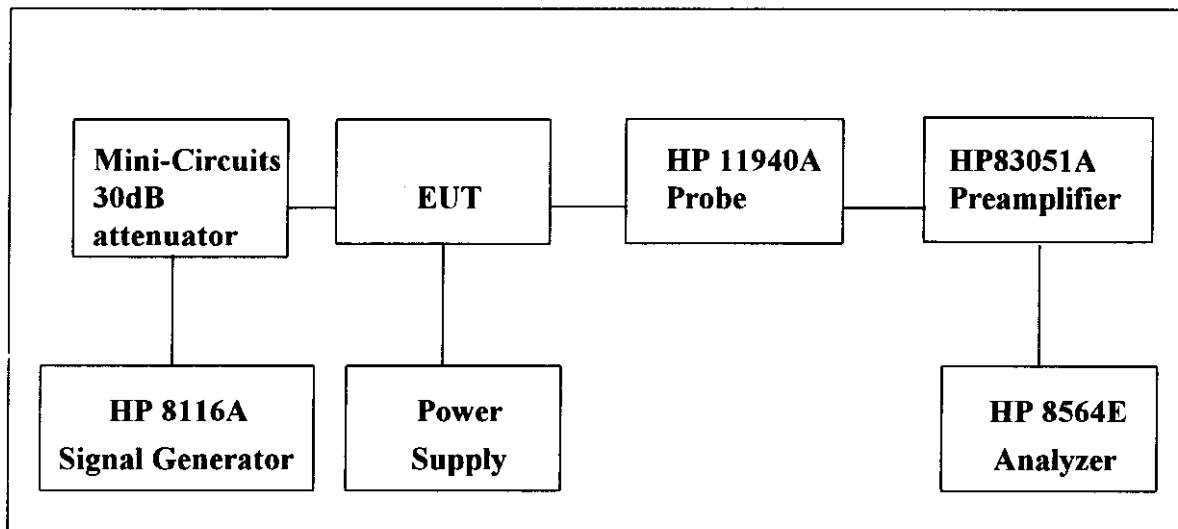
4.1 Rules and Specification Limits

2.989 .

74.861 (e) (3) : Any form of modulation may be used . A maximum deviation of ± 75 KHz is permitted when frequency modulation is employed.

74.861 (e) (5) : The operation bandwidth shall not exceed 200 KHz .

4.2 Test Configuration & List of Test Instruments



List of test Instrument :

Instrument name	Model No.	Brand	Serial No.
Spectrum analyzer (9K~40GHz)	8564E	HP	
Preamplifier (45M~50GHz)	83051A	HP	VS36433002
Close-Field Probe 30M~1GHz	11940A	HP	---

4.3 Measurement Procedure

1. Connect the EUT as Section 4.2 .
2. Plot the unmodulated chart shows on spectrum.
3. Set the output of the signal generator to 100 Hz, 612Hz, 3.940KHz and 13.284KHz.
Increase the amplitude of the signal, while monitoring the modulation meter. Until modulation is max. Measure the bandwidth under 26 dB compared to the unmodulated fundamental carrier peak level of the modulated signal displayed on the spectrum analyzer.
4. The occupied Bandwidth was measured as follow two pages.

4.4 Measurement Result

The occupied bandwidth's plot is presented on following pager which illustrates compliance with the rules.

Calculation of Necessary Bandwidth (Bn)

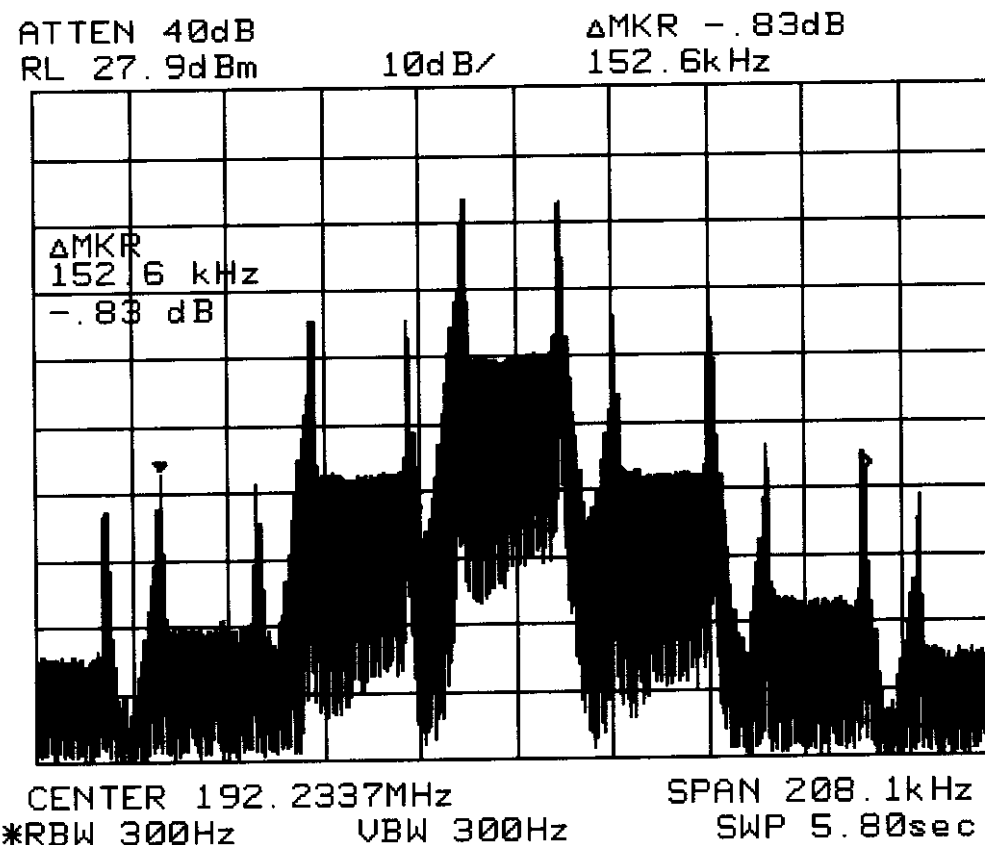
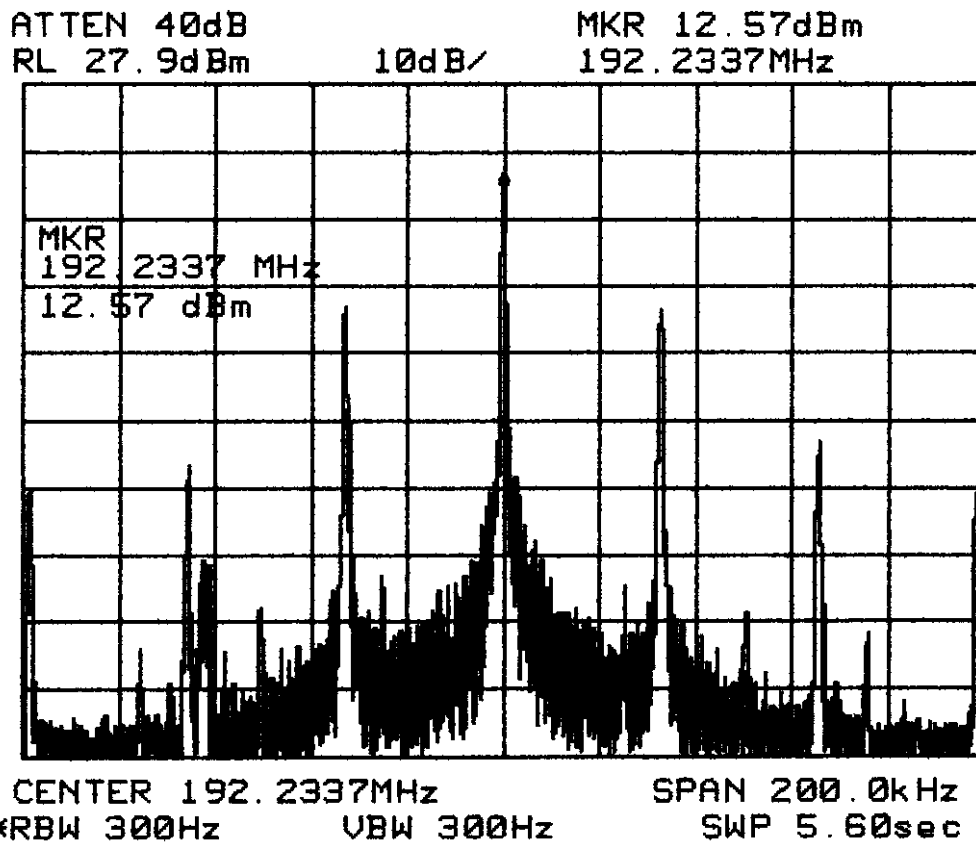
$$B_n = 2M + 2D$$

$$M = \text{Max. Modulation Frequency} = 13.284 \text{ KHz}$$

$$D = \text{Peak Frequency Deviation} = 23.76 \text{ KHz} \quad (\text{Chart 3-1})$$

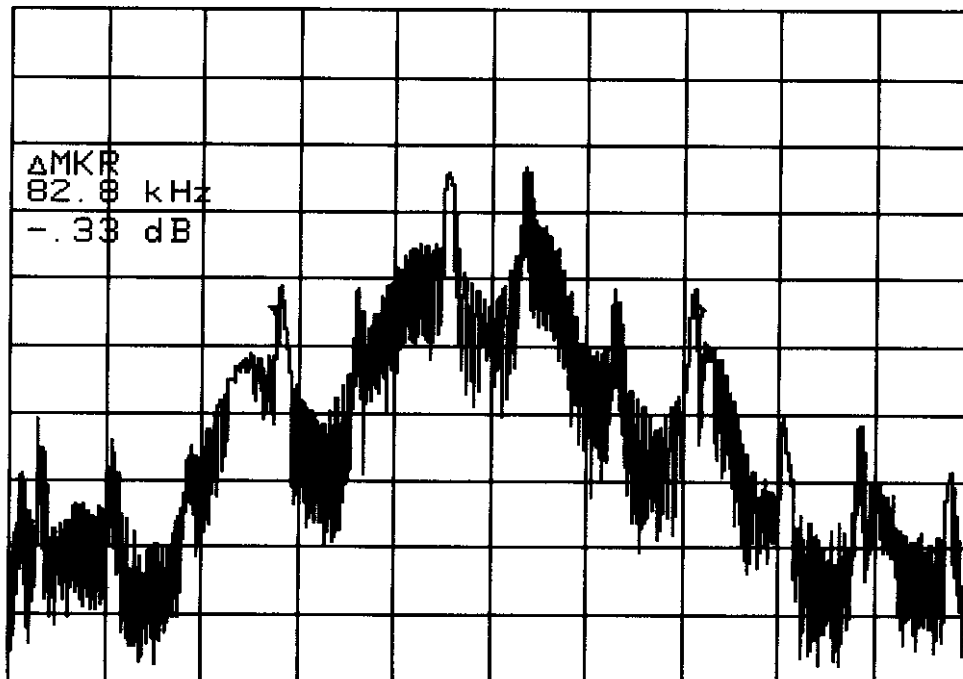
$$K = 1$$

$$B_n = 74.088 \text{ KHz}$$



100Hz

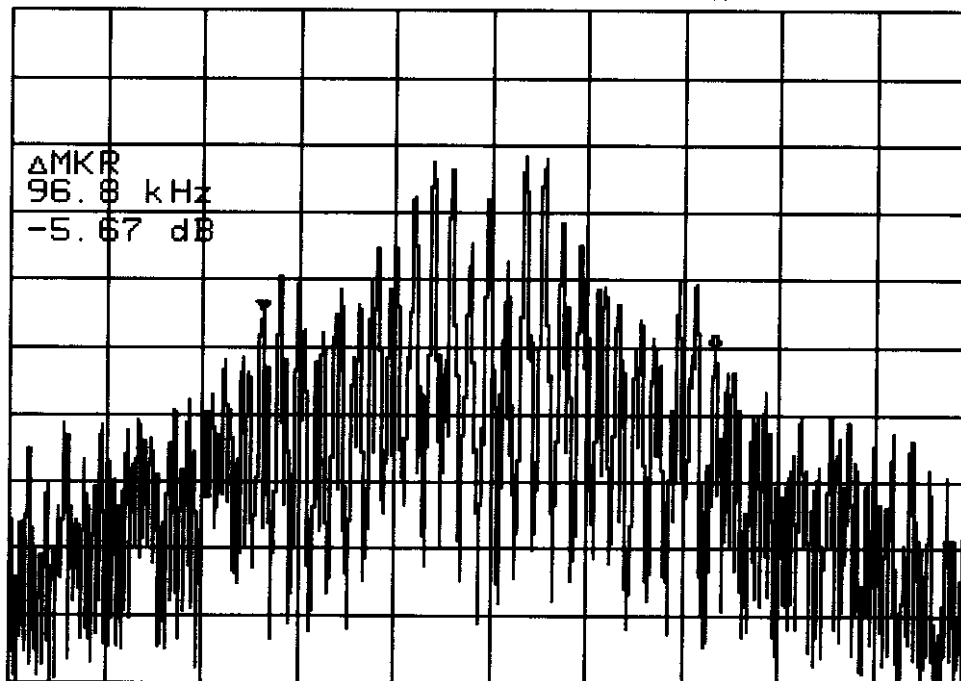
ATTEN 40dB
RL 27.9dBm 10dB/ Δ MKR -.33dB
82.8kHz



612Hz

CENTER 192.2337MHz SPAN 188.1kHz
*RBW 300Hz VBW 300Hz SWP 5.30sec

ATTEN 40dB
RL 27.9dBm 10dB/ Δ MKR -5.67dB
96.8kHz



3.94KHz

CENTER 192.2337MHz SPAN 206.1kHz
*RBW 300Hz VBW 300Hz SWP 5.80sec

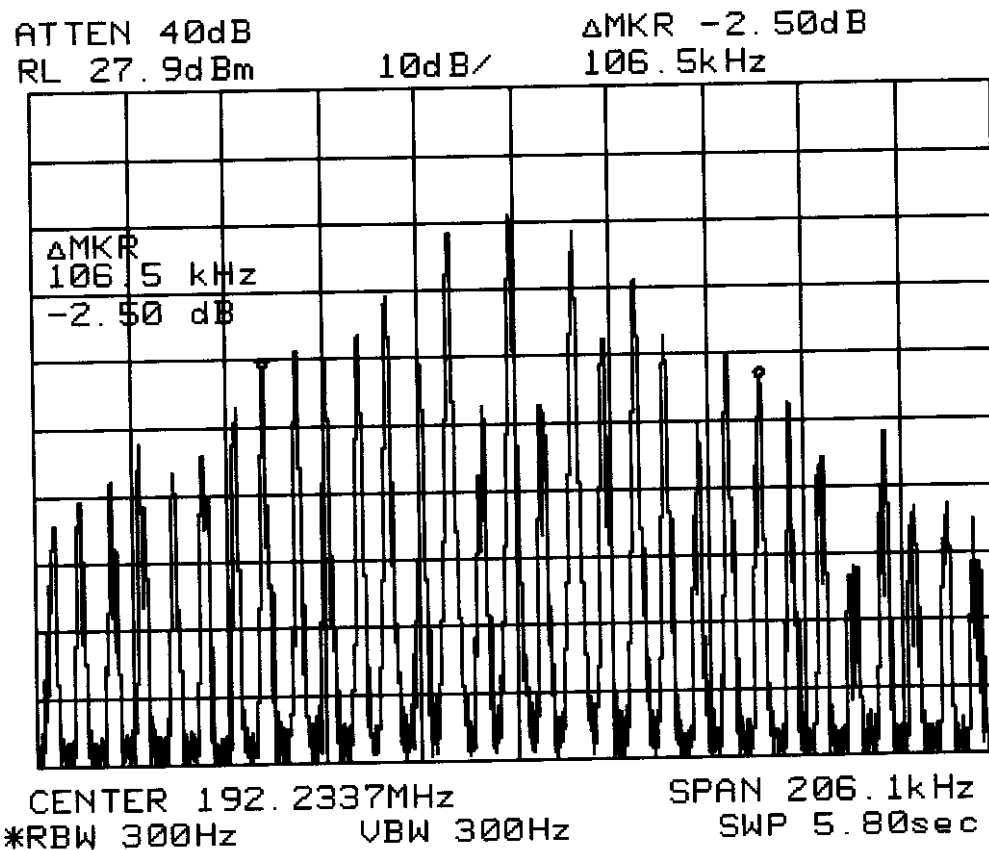


Chart 5 Field Strength of Spurious Radiation Measurement

5.1 Rules and Specification Limits

2.993 (a) : Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, Power leads, or intermediate circuit elements under normal conditions of installation and operation.

74.861(e)(b)(iii) : Spurious and harmonics must be at least $43 + 10 \log (\text{Output Power})$ below the Carrier peak

2.997 : In all measurements set forth , the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.

5.2 Measurement Condition & Setup

Pretest : Prior to the final test (OATS test) ,the EUT is placed in a shielded enclosure ,GTEM, and scan from 30MHz to 1GHz. This is done to ensure the radiation exactly emits form the EUT.

Final test : Final radiation measurements is made on a **3 - meter**, open-field test site. The EUT is placed on a nonconductive table which is 0.8 m height, the top surface is 1.0 x 1.5 meter. All the placement is according to ANSI C63.4 - 1992.

The spectrum is examined from 30 MHz to 18 GHz measured by HP spectrum.

The EMCO whole range Antenna is used to measure frequency from 30 MHz to 18 GHz. The final test is used the spectrum HP 8591A & HP 8564E.

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency . The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meter to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading .The spectrum analyzer's 6dB bandwidth is set to 120 K Hz , and the EUT is measured at quasi-peak mode.

If the emission is close to the frequency band of ambient, the data will be rechecked by the tester and the corrected data will be written in the test data sheet. If the emission is just within the ambient ,the data from GTEM will be taken as the final data.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB) and cable loss (dB) at the appropriate frequency .

$$FI_a \text{ (dBuV/m)} = FI_r \text{ (dBuV)} + AF \text{ (dB)} + CL \text{ (dB)}$$

FI_a : Actual Field Intensity

FI_r : Reading of the Field Intensity

AF : Antenna Factor

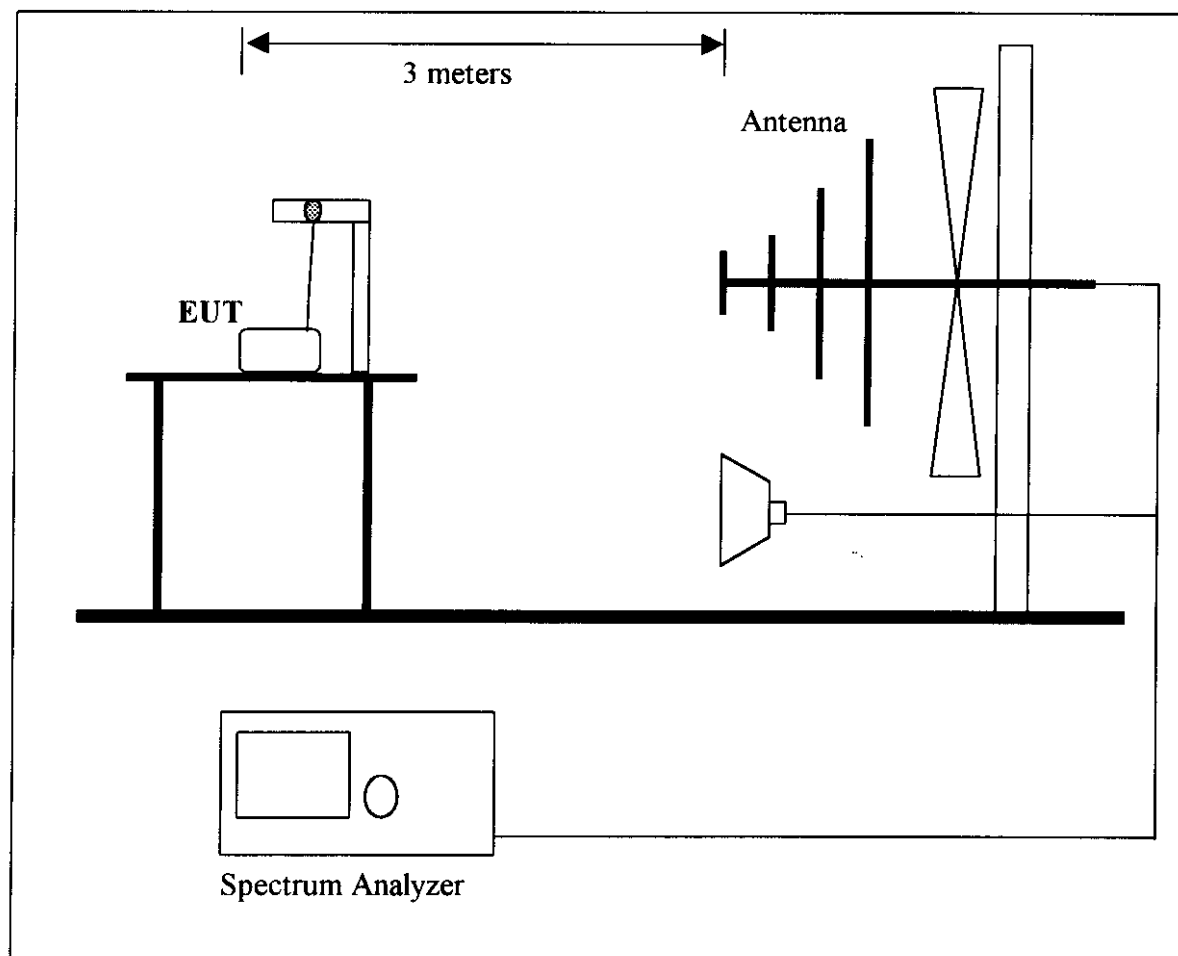
CL : Cable Loss

5.3 List of Measurement Instruments

Instrument name	Model No.	Brand	Serial No.	Calibration Date	
				Last	Next
Spectrum analyzer	8568B	H P	3004A18617	05/15/98	05/15/99
Quasi-peak Adapter	85650A	H P	2521A00984	05/15/98	05/15/99
RF Pre-selector	85685A	H P	2947A01011	05/15/98	05/15/99
Spectrum analyzer	8591A	H P	2919A00263	01/07/98	01/07/99
Spectrum analyzer	8564E	H P	US36433002	08/09/98	08/09/99
Antenna(30M-2G Hz)	3142	EMCO	1296	06/10/98	06/10/99
Antenna(1G-18G Hz)	3142	EMCO	5178	08/09/98	08/09/99
Open test side (Antenna, Amplify, cable calibrated together)				05/15/98	05/15/99

The level of confidence of 95% , the uncertainty of measurement of radiated emission is ± 4.96 dB.

5.4 Measurement Configuration



5.5 Measurement Result (174.500MHz) : (Horizontal for 30 MHz ~ 1 GHz)

Test Conditions:

Testing room : Temperature : 23 °C

Humidity : 72 % RH

Testing site : Temperature : 31 °C

Humidity : 85 % RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

218.130	58.88	1.00	156	-20.30	38.58	82.23	-43.65
232.665	53.93	1.00	312	-19.53	34.40	82.23	-47.83
261.758	50.31	1.00	35	-18.24	32.07	82.23	-50.16
349.008	39.14	1.00	288	-14.46	24.68	82.23	-57.55
431.970	37.96	1.00	267	-9.31	28.65	82.23	-53.58
523.488	48.08	1.00	294	-10.99	37.09	82.23	-45.14
697.988	46.25	1.00	185	-12.73	33.52	82.23	-48.71
785.210	46.15	1.00	241	-11.99	34.16	82.23	-48.07
872.458	55.75	1.00	226	-13.76	41.99	82.23	-40.24

Note:

1. Margin = Amplitude - limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude - Correction Factors
3. Correction factor = Antenna factor + (Cable Loss - Amplitude gain)
(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)
4. Attenuation required = 43 + 10 log (1.722 mW) = 15.36
Limit = 97.59 – 15.36 = 82.23

Measurement Result (174.500MHz) : (Horizontal for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (cm)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
1.000	41.04	100.00	61	-8.67	32.37	54	-21.63
1.047	55.04	100.00	19	-8.67	46.37	54	-7.63
1.133	43.20	100.00	322	-8.67	34.53	54	-19.47
1.203	35.70	100.00	37	-8.67	27.03	54	-26.97
1.223	51.20	100.00	162	-8.67	42.53	54	-11.47
1.270	40.37	100.00	316	-8.67	31.70	54	-22.30
1.337	38.37	100.00	271	-8.67	29.70	54	-24.30
1.397	43.70	100.00	219	-8.67	35.03	54	-18.97
1.730	38.04	100.00	156	-8.67	29.37	54	-24.63
1.810	35.04	100.00	252	-8.67	26.37	54	-27.63
1.843	37.54	100.00	15	-8.67	28.87	54	-25.13
2.443	43.04	100.00	168	-8.67	34.37	54	-19.63

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected

Measurement Result (174.500MHz) : (Vertical for 30 MHz ~ 1 GHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

218.130	65.36	1.00	137	-20.30	45.06	82.23	-37.17
232.665	60.70	1.00	169	-19.53	41.17	82.23	-41.06
261.758	54.88	1.00	157	-18.24	36.64	82.23	-45.59
349.008	44.47	1.00	307	-14.46	30.01	82.23	-52.22
431.970	36.10	1.00	196	-9.31	26.79	82.23	-55.44
523.488	51.68	1.00	204	-10.99	40.69	82.23	-41.54
697.988	48.82	1.00	162	-12.73	36.09	82.23	-46.14
785.210	53.85	1.00	259	-11.99	41.86	82.23	-40.37
872.458	61.19	1.00	124	-13.76	47.43	82.23	-34.80

Measurement Result (174.500MHz) : (Vertical for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude (dBuV/m)	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (cm)	Table ($^{\circ}$)	(dB)		Limit (dBuV/m)	Margin (dB)
1.000	41.04	100.00	80	-8.67	32.37	54	-21.63
1.047	59.04	100.00	159	-8.67	50.37	54	-3.63
1.133	46.87	100.00	32	-8.67	38.20	54	-15.80
1.203	39.87	100.00	317	-8.67	31.20	54	-22.80
1.223	55.87	100.00	163	-8.67	47.20	54	-6.80
1.270	37.87	100.00	36	-8.67	29.20	54	-24.80
1.337	41.54	100.00	171	-8.67	32.87	54	-21.13
1.397	47.37	100.00	329	-8.67	38.70	54	-15.30
1.730	40.20	100.00	126	-8.67	31.53	54	-22.47
1.810	41.37	100.00	22	-8.67	32.70	54	-21.30
1.843	38.87	100.00	195	-8.67	30.20	54	-23.80
2.443	41.37	100.00	148	-8.67	32.70	54	-21.30

Measurement Result (192.230MHz) : (Horizontal for 30 MHz ~ 1 GHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

176.223	70.11	1.00	45	-21.96	48.15	82.23	-34.08
208.265	62.45	1.00	169	-20.19	42.26	82.23	-39.97
240.310	68.60	1.00	168	-19.18	49.42	82.23	-32.81
288.380	49.67	1.00	85	-16.45	33.22	82.23	-49.01
384.488	48.30	1.00	182	-13.45	34.85	82.23	-47.38
576.735	48.04	1.00	122	-12.24	35.80	82.23	-46.43
769.005	64.49	1.00	189	-12.40	52.09	82.23	-30.14
865.105	49.36	1.00	97	-13.80	35.56	82.23	-46.67

Note:

1. Margin = Amplitude - limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude - Correction Factors
3. Correction factor = Antenna factor + (Cable Loss - Amplitude gain)
(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)
4. Attenuation required = $43 + 10 \log (1.094 \text{ mW}) = 13.39$
Limit = $95.62 - 13.39 = 82.23$

Measurement Result (192.230MHz) : (Horizontal for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude (dBuV/m)	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant. H. (cm)	Table (°)	(dB)		Limit (dBuV/m)	Margin (dB)
1.057	43.12	100.00	212	-8.67	34.45	54	-19.55
1.107	36.45	100.00	156	-8.67	27.78	54	-26.22
1.153	59.95	100.00	312	-8.67	51.28	54	-2.72
1.250	45.62	100.00	35	-8.67	36.95	54	-17.05
1.347	43.62	100.00	288	-8.67	34.95	54	-19.05
1.537	40.12	100.00	267	-8.67	31.45	54	-22.55
1.810	37.79	100.00	294	-8.67	29.12	54	-24.88
1.923	39.12	100.00	185	-8.67	30.45	54	-23.55
2.307	41.12	100.00	241	-8.67	32.45	54	-21.55

Measurement Result (192.230MHz) : (Vertical for 30 MHz ~ 1 GHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

176.223	61.34	1.00	183	-21.96	39.38	82.23	-42.85
208.265	68.72	1.00	144	-20.19	48.53	82.23	-33.70
240.310	76.42	1.00	160	-19.18	57.24	82.23	-24.99
288.380	58.98	1.00	15	-16.45	42.53	82.23	-39.70
384.488	54.83	1.00	197	-13.45	41.38	82.23	-40.85
576.735	47.01	1.00	38	-12.24	34.77	82.23	-47.46
769.005	69.53	1.00	65	-12.40	57.13	82.23	-25.10
865.105	55.59	1.00	202	-13.80	41.79	82.23	-40.44

Measurement Result (192.230MHz) : (Vertical for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (cm)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
1.057	46.95	100.00	181	-8.67	38.28	54	-15.72
1.107	39.12	100.00	19	-8.67	30.45	54	-23.55
1.153	61.29	100.00	332	-8.67	52.62	54	-1.38
1.250	44.95	100.00	31	-8.67	36.28	54	-17.72
1.347	45.12	100.00	183	-8.67	36.45	54	-17.55
1.537	41.62	100.00	326	-8.67	32.95	54	-21.05
1.810	41.79	100.00	170	-8.67	33.12	54	-20.88
1.923	37.29	100.00	300	-8.67	28.62	54	-25.38
2.307	42.12	100.00	122	-8.67	33.45	54	-20.55

Measurement Result (213.390MHz) : (Horizontal for 30 MHz ~ 1 GHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

160.050	66.62	1.00	68	-22.80	43.82	82.23	-38.41
177.820	67.51	1.00	111	-21.91	45.60	82.23	-36.63
195.610	60.07	1.00	25	-21.00	39.07	82.23	-43.16
426.780	53.00	1.00	292	-10.67	42.33	82.23	-39.90
640.170	65.89	1.00	189	-13.34	52.55	82.23	-29.68
746.870	50.97	1.00	131	-13.56	37.41	82.23	-44.82
853.550	64.42	1.00	91	-13.77	50.65	82.23	-31.58

Note:

1. Margin = Amplitude - limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude - Correction Factors
3. Correction factor = Antenna factor + (Cable Loss - Amplitude gain)
(For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)
4. Attenuation required = $43 + 10 \log (2.643 \text{ mW}) = 17.22$
Limit = $99.45 - 17.22 = 82.23$

Measurement Result (213.390MHz) : (Horizontal for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude (dBuV/m)	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (cm)	Table (°)	(dB)		Limit (dBuV/m)	Margin (dB)
1.007	40.20	100.00	261	-8.67	31.53	54	-22.47
1.047	41.54	100.00	197	-8.67	32.87	54	-21.13
1.067	61.54	100.00	32	-8.67	52.87	54	-1.13
1.083	37.04	100.00	322	-8.67	28.37	54	-25.63
1.130	43.70	100.00	162	-8.67	35.03	54	-18.97
1.173	45.20	100.00	36	-8.67	36.53	54	-17.47
1.280	54.37	100.00	278	-8.67	45.70	54	-8.30
1.337	38.20	100.00	2	-8.67	29.53	54	-24.47
1.493	44.04	100.00	196	-8.67	35.37	54	-18.63
1.537	38.70	100.00	258	-8.67	30.03	54	-23.97
1.667	38.87	100.00	175	-8.67	30.20	54	-23.80
1.707	45.87	100.00	184	-8.67	37.20	54	-16.80
1.747	40.37	100.00	261	-8.67	31.70	54	-22.30
1.920	40.37	100.00	10	-8.67	31.70	54	-22.30
2.133	45.54	100.00	304	-8.67	36.87	54	-17.13
2.347	44.04	100.00	38	-8.67	35.37	54	-18.63
2.560	42.54	100.00	105	-6.84	35.70	54	-18.30
2.770	41.87	100.00	311	-6.84	35.03	54	-18.97

Measurement Result (213.390MHz) : (Vertical for 30 MHz ~ 1 GHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Limit	Margin
MHz	dBuV	m	degree	dB/m	dBuV/m	dBuV/m	dB

160.048	74.15	1.00	232	-22.80	51.35	82.23	-30.88
177.825	74.58	1.00	98	-21.91	52.67	82.23	-29.56
195.610	66.14	1.00	153	-21.00	45.14	82.23	-37.09
426.778	67.16	1.00	198	-10.67	56.49	82.23	-25.74
640.173	73.04	1.00	128	-13.34	59.70	82.23	-22.53
746.870	53.31	1.00	298	-13.56	39.75	82.23	-42.48
853.548	73.71	1.00	125	-13.77	59.94	82.23	-22.29

Measurement Result (213.390MHz) : (Vertical for 1 GHz ~ 18 GHz)

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (cm)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
1.007	41.37	100.00	26	-8.67	32.70	54	-21.30
1.047	35.37	100.00	190	-8.67	26.70	54	-27.30
1.067	58.87	100.00	82	-8.67	50.20	54	-3.80
1.083	35.70	100.00	352	-8.67	27.03	54	-26.97
1.130	41.70	100.00	12	-8.67	33.03	54	-20.97
1.173	45.87	100.00	236	-8.67	37.20	54	-16.80
1.280	54.70	100.00	298	-8.67	46.03	54	-7.97
1.337	41.20	100.00	358	-8.67	32.53	54	-21.47
1.493	49.20	100.00	167	-8.67	40.53	54	-13.47
1.537	43.37	100.00	254	-8.67	34.70	54	-19.30
1.667	36.70	100.00	17	-8.67	28.03	54	-25.97
1.707	43.37	100.00	104	-8.67	34.70	54	-19.30
1.747	36.37	100.00	269	-8.67	27.70	54	-26.30
1.920	39.87	100.00	100	-8.67	31.20	54	-22.80
2.133	43.70	100.00	304	-8.67	35.03	54	-18.97
2.347	44.70	100.00	118	-8.67	36.03	54	-17.97
2.560	43.87	100.00	185	-6.84	37.03	54	-16.97
2.770	43.04	100.00	31	-6.84	36.20	54	-17.80

Chart 6 Frequency Stability Tolerance Measurement

6.1 Rules and Specification Limits

2.995

74.861(e)(4): The frequency tolerance of the transmitter shall be 0.005 percent.

6.2 Measurement Condition & Setup with Temperature Variation

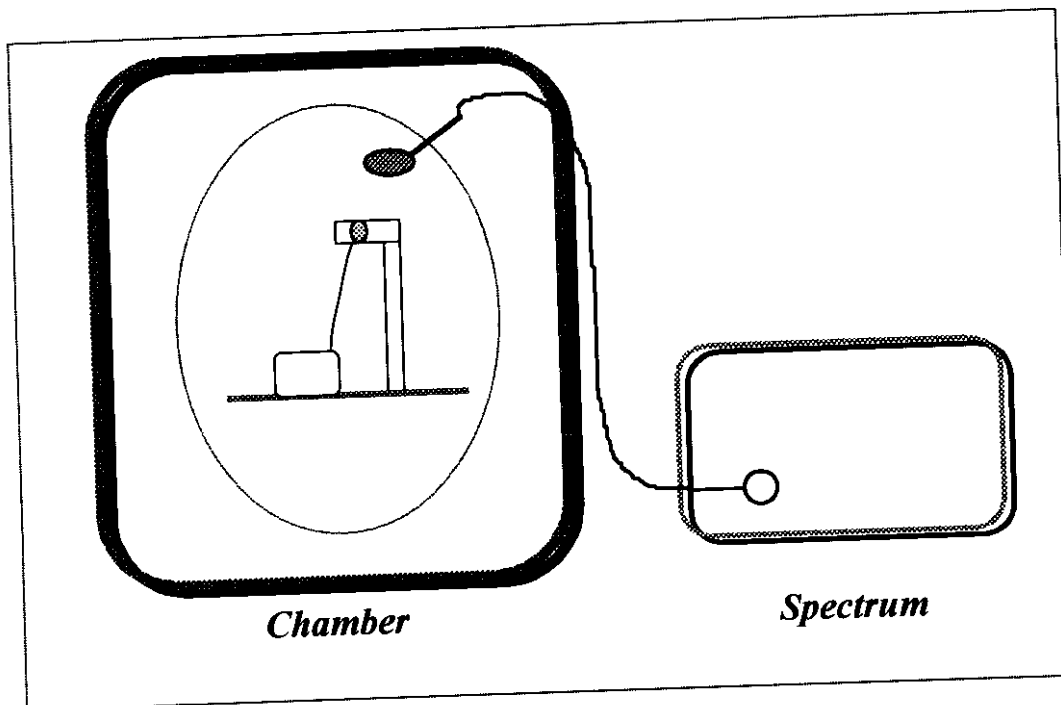
1. Place the EUT in the chamber, powered in its normal operation.
2. Set the temperature of the chamber -30 degree Centigrade. Allow the equipment to stabilize at that temperature.
3. Measured the carrier frequency using preamplifier and frequency counter.
4. Repeated procedures 1 to 3 from -20 to 50 degree Centigrade at intervals of 10 degree.

6.3 List of Measurement Instruments with Temperature Variation

List of test Instrument :

Instrument name	Model No.	Brand	Remark
Spectrum Analyzer	8591A	H P	1.8GHz
Temperature Chamber	THS-MV2	King Son	
Near field Probe	7405-901	EMCO	
Power Supply			
Auto Transformer	Powerstat	Supprior Elec. Co.	

6.4 Measurement Configuration of Temperature variation test :



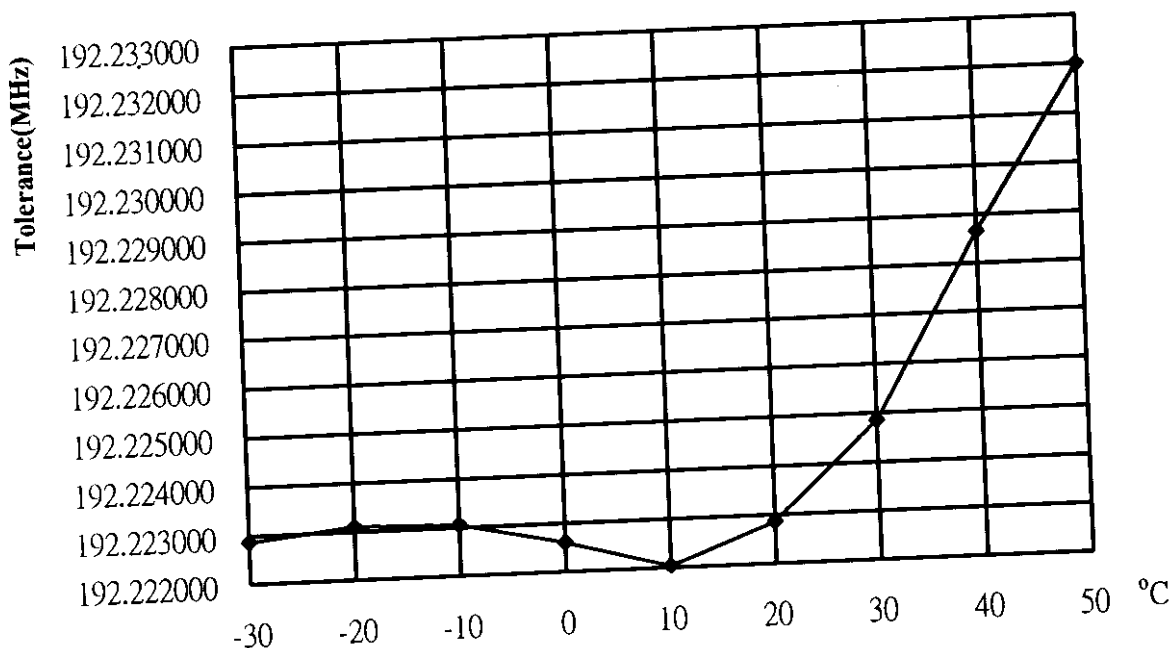
6.5 Measurement Result with Temperature Variation

A plot and table is presented which illustrates compliance with the rule where the center frequency is 192.230 MHz.

Temperature Variation Table

Temperature (Centigrade)	Frequency (MHz)	Tolerance (MHz)
-30	192.222876	192.220388~192.239611
-20	192.223111	192.220388~192.239611
-10	192.223050	192.220388~192.239611
0	192.222610	192.220388~192.239611
10	192.222040	192.220388~192.239611
20	192.222860	192.220388~192.239611
30	192.224850	192.220388~192.239611
40	192.228650	192.220388~192.239611
50	192.232001	192.220388~192.239611

Temperatuer Variation Vs. Frequency Chart



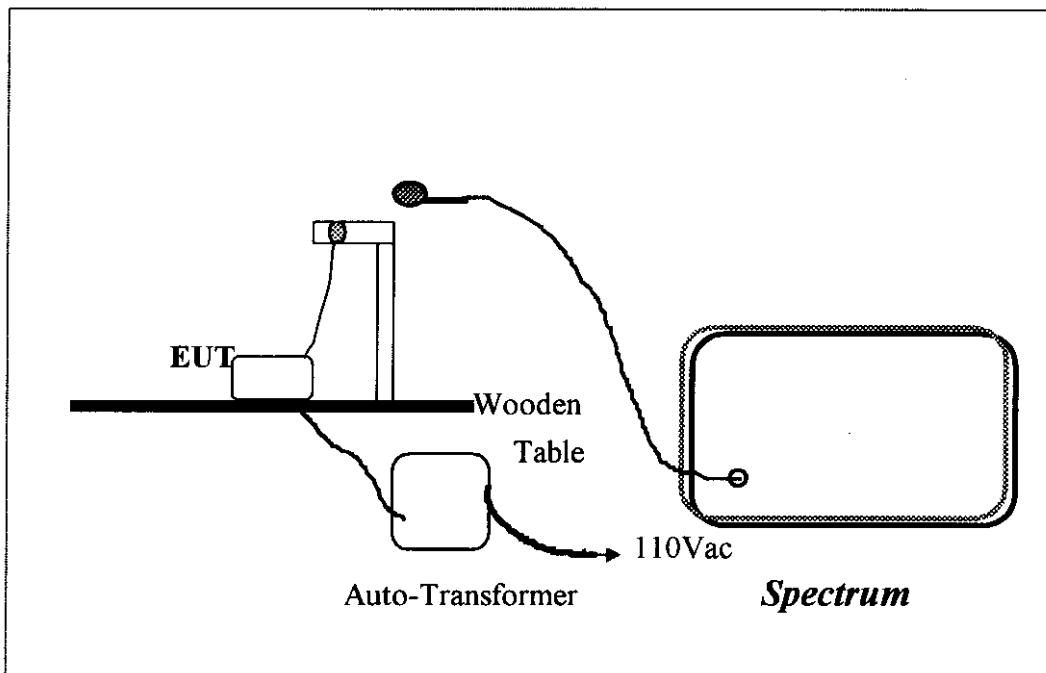
6.6 Measurement Condition & Setup with Voltage Variation

1. Attached the power line of the power supply to the battery position of the EUT.
2. Tuned the output power level to battery end point , 85 % , 100%, 115% of the normal operation power of EUT.
3. Recorded the frequency with a frequency counter .

6.7 List of test Instrument :

Instrument name	Model No.	Brand	Remark
Spectrum Analyzer	8591A	H P	1.8GHz
Temperature Chamber	THS-MV2	King Son	
Near field Probe	7405-901	EMCO	
Power Supply			
Auto Transformer	Powerstat	Supprior Elec. Co.	

6.8 Configuration of Voltage variation test :



6.9 Measurement Result with Voltage Variation

Frequency Stability of Voltage Variation Measurement Table

Supply Voltage (Volt)	Frequency (MHz)	Tolerance (MHz)
7.65 (85%)	192.22366	192.220388~192.239611
9.00 (100%)	192.22355	192.220388~192.239611
10.35 (115%)	192.22376	192.220388~192.239611
Endpoint-Voltage : 1.6V		

Voltage Variation Vs. Frequency Chart

